

What is claimed is:

1. An alloy consisting essentially of rhenium and from about 0.025% up to about 10% by weight tungsten, the alloy exhibiting a room temperature tensile strength in excess of 150 Ksi and an elongation of 25% or greater as measured in accordance with ASTM E8-03.
2. The alloy according to claim 1 consisting essentially of rhenium and from about 0.025% to about 5% by weight tungsten.
3. The alloy according to claim 1 consisting essentially of rhenium and from about 0.05% to about 2.5% by weight tungsten.
4. The alloy according to claim 1 consisting essentially of rhenium and from about 0.06% to about 1.25% by weight tungsten.
5. An alloy consisting essentially of rhenium and from about 0.025% up to about 10% by weight tungsten formed by a process comprising:
  - coating a metal powder consisting essentially of rhenium with a liquid comprising a tungsten compound;
  - drying the coated metal powder;
  - compressing the coated metal powder to form a compact; and
  - sintering the compact to form the alloy.
6. The alloy according to claim 5 consisting essentially of rhenium and from about 0.025% to about 5% by weight tungsten.
7. The alloy according to claim 5 consisting essentially of rhenium and from about 0.05% to about 2.5% by weight tungsten.

8. The alloy according to claim 5 consisting essentially of rhenium and from about 0.06% to about 1.25% by weight tungsten.

9. A method comprising:  
coating a metal powder consisting essentially of rhenium with a liquid comprising a tungsten compound;  
drying the coated rhenium powder;  
compressing the coated powder to form a compact; and  
sintering the compact to form an alloy consisting essentially of rhenium and from about 0.025% up to about 10% by weight tungsten.

10. The method according to claim 9 wherein the alloy consists essentially of rhenium and from about 0.025% to about 5% by weight tungsten.

11. The method according to claim 9 consisting essentially of rhenium and from about 0.05% to about 2.5% by weight tungsten.

12. The method according to claim 9 consisting essentially of rhenium and from about 0.06% to about 1.25% by weight tungsten.

13. The method according to claim 9 wherein the liquid comprises ammonium metatungstate.

14. The method according to claim 9 further comprising cold rolling the sintered compact.

15. The method according to claim 9 further comprising annealing the sintered compact.

16. A wire formed of an alloy consisting essentially of rhenium and from about 0.025% up to about 10% by weight tungsten.

17. The wire according to claim 16 wherein the alloy consists essentially of rhenium and from about 0.025% to about 5% by weight tungsten.

18. The wire according to claim 16 wherein the alloy consists essentially of rhenium and from about 0.05% to about 2.5% by weight tungsten.

19. The wire according to claim 16 wherein the alloy consists essentially of rhenium and from about 0.06% to about 1.25% by weight tungsten.

20. A method of forming an alloy consisting essentially of rhenium and from about 0.025% up to about 10% by weight tungsten comprising:  
providing a precipitate comprising a rhenium compound and a tungsten compound;  
compressing the precipitate to form a compact; and  
sintering the compact to form the alloy.

21. An alloy consisting essentially of rhenium and from about 0.025% up to about 10% by weight of a metal selected from the group consisting of tungsten, molybdenum, tantalum, iridium, ruthenium and osmium, the alloy formed by a process comprising:

coating a metal powder consisting essentially of rhenium with a liquid comprising a compound selected from the group consisting of tungsten, molybdenum, tantalum, iridium, ruthenium and osmium;  
drying the coated metal powder;  
compressing the coated metal powder to form a compact; and  
sintering the compact to form the alloy.

22. A method comprising:

coating a metal powder consisting essentially of rhenium with a liquid comprising a compound selected from the group consisting of tungsten, molybdenum, tantalum, iridium, ruthenium and osmium;

drying the coated rhenium powder;

compressing the coated powder to form a compact; and

sintering the compact to form an alloy consisting essentially of rhenium and from about 0.025% up to about 10% by weight of a metal selected from the group consisting of tungsten, molybdenum, tantalum, iridium, ruthenium and osmium.

23. A method of forming an alloy consisting essentially of rhenium and from about 0.025% up to about 10% by weight of a metal selected from the group consisting of tungsten, molybdenum, tantalum, iridium, ruthenium and osmium, the method comprising:

providing a precipitate comprising a rhenium compound and a compound comprising a metal selected from the group consisting of tungsten, molybdenum, tantalum, iridium, ruthenium and osmium;

compressing the precipitate to form a compact; and

sintering the compact to form the alloy.